

IMAGING APPARATUS AND CAMERA SYSTEM

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates generally to an imaging apparatus having an image stabilization unit configured to move the image plane so as to correct a blur in imaging, and more particularly to an imaging apparatus and a camera system which can provide live-view imaging.

Description of the Related Art

[0002] One recently proposed imaging apparatus includes an image stabilization unit configured to parallel move an image sensor. One proposed image stabilization unit has a large motion range for a higher image stabilization performance. Since the imaging optical system has a limited range (image circle) for projecting the object image, an excessive movement of the image stabilization unit shields a light flux from the imaging optical system and reduces a light amount. In addition, when an optical viewfinder and the image stabilization unit for translating the image sensor are combined with each other and the optical axis in the optical viewfinder and the center of the image sensor shift from each other, the composition shifts.

[0003] Japanese Patent Laid-Open No. ("JP") 2009-251491 discloses an imaging apparatus that operates only a lens image stabilization unit in an imaging preliminary operation and only an image plane image stabilization unit (image sensor, image stabilization unit) in an exposure operation in order to obtain the image stabilization effect without causing the composition to shift. JP 2010-117591 discloses an imaging apparatus that changes a moving center (a center of a movable range) in the image sensor image stabilization unit based on an instruction from a user in special imaging such as tilt-shift imaging.

[0004] The imaging apparatus disclosed in JP 2009-251491 addresses only the optical viewfinder imaging, and thus may shield part of a light flux from the imaging optical system in a live-view mode, causing a peripheral light amount to drop.

[0005] The imaging apparatus disclosed in JP 2010-117591 cannot set the moving center according to the intention of the user in non-special imaging and the maximized image stabilization function. In addition, since this reference does not consider the relationship with the optical viewfinder, a composition shift may occur.

SUMMARY OF THE INVENTION

[0006] The present invention provides an imaging apparatus and a camera system which can suppress a peripheral light amount drop and a blur in an optical system while suppressing a composition shift.

[0007] An imaging apparatus according to one aspect of the present invention includes an image sensor configured to capture an object image formed through an imaging optical system, an image sensor image stabilization unit configured to move the image sensor on a plane orthogonal to an optical axis in the imaging optical system, and a controller configured to control a movement by the image sensor, image stabilization unit, and to determine a moving center in the image sensor image stabilization unit based on information

on the imaging optical system in an electronic preview mode used to observe an image signal about the object image based on an output from the image sensor.

[0008] Further features of the present invention will become apparent from the following description of exemplary embodiments with reference to the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIGS. 1A and 1B are a central sectional view of a camera system and a block diagram illustrating an electrical configuration according to an embodiment of the present invention.

[0010] FIG. 2 is an exploded perspective view of an image sensor image stabilization unit.

[0011] FIG. 3 is a flowchart illustrating an operation of an imaging apparatus.

[0012] FIGS. 4A to 4E explain light shielding states.

DESCRIPTION OF THE EMBODIMENTS

[0013] Referring now to the accompanying drawings, a detailed description will be given of embodiments according to the present invention. Corresponding elements in each figure will be designated by the same reference numerals, and a duplicate description thereof will be omitted.

[0014] FIGS. 1A and 1B are a central sectional view of a camera system and a block diagram illustrating an electrical configuration according to an embodiment of the present invention, respectively. This embodiment sets a coordinate system as illustrated in FIG. 1A for explanatory convenience.

[0015] The camera system includes an imaging apparatus 1 and a lens unit (lens apparatus) 2. The lens unit 2 is detachably attached to the imaging apparatus 1 via a mount (mechanical contact) 18. The imaging apparatus 1 and the lens unit 2 communicate with each other via the electric contacts 11.

[0016] The camera system includes an imaging unit, an image processing unit, a recorder/reproducer, and a controller. The imaging unit includes an imaging optical system 3, an image sensor 6, and a shutter unit 16. The image processor has an image processor 7. The recorder/reproducer has a memory unit 8 and a rear display unit 9. The controller includes a camera system control circuit (controller) 5, an operation detector 10, a lens system control circuit (storage unit) 12, a lens driver 13, an image sensor image stabilization unit 14, and a blur detector 15.

[0017] The imaging unit is an optical processing system for imaging object light on the imaging surface on the image sensor 6 via the imaging optical system 3. While a mirror in a quick-return mirror unit 20 is retreated, the shutter unit 16 controls an object light amount by driving the shutter curtain.

[0018] This embodiment can select two modes according to the operation of the quick-return mirror unit 20 in the imaging preliminary operation. The first mode is an optical preview mode that enables an object image to be optically observed with a viewfinder optical system (optical viewfinder unit) 17. The second mode is an electronic preview mode that enables an object image to be electrically observed by displaying on the rear display unit 9 an image signal about the object image based on the output from the image sensor 6. In the optical preview mode, a proper exposure amount and a focus evaluation amount are